

1241202 - R8 SDMS



Third West Air Monitor Result  
Shepherd, Michael

to:

Joyce Ackerman, 'Craig Barnitz (cbarnitz@utah.gov)'

03/21/2012 09:59 AM

Hide Details

From: "Shepherd, Michael" <Michael.Shepherd@PacifiCorp.com>

To: Joyce Ackerman/R8/USEPA/US@EPA, "'Craig Barnitz (cbarnitz@utah.gov)'"  
<cbarnitz@utah.gov>

1 Attachment



231818-1.pdf

Joyce & Craig,

We had two positive hits on Thursday, March 15, 2012. Both were chrysotile, see the attached. Please let me know if you have any questions or concerns.

Thanks,

Mike Shepherd  
Project Manager  
Rocky Mountain Power - Major Projects  
801.220.4584 Office  
801.631.1310 Cell  
801.220.2797 Fax  
[michael.shepherd@pacificorp.com](mailto:michael.shepherd@pacificorp.com)



# **Reservoirs Environmental, Inc.**

March 19, 2012

Laboratory Code: RES  
Subcontract Number: NA  
Laboratory Report: RES 231818-1  
Project # / P.O. #: None Given  
Project Description: 3rd West Sub - RMP

Eldon Romney  
R & R Environmental  
47 West 9000 South #2  
Sandy UT 84070

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 231818-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely,

Jeanne Spencer Orr  
President

# RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

TABLE I. TEM AIR FILTER SAMPLE DATA AND ANALYTICAL RESULTS

RES Job Number: RES 231818-1  
 Client: R & R Environmental  
 Client Project Number / P.O.: None Given  
 Client Project Description: 3rd West Sub - RMP  
 Date Samples Received: March 16, 2012  
 Analysis Type: TEM, AHERA  
 Turnaround: 6 Hour  
 Date Samples Analyzed: March 17, 2012

| Client ID Number | Lab ID Number | Area Analyzed (mm <sup>2</sup> ) | Air Volume Sampled (L) | Number of Asbestos Structures Detected | Analytical Sensitivity (s/cc) | Asbestos Concentration (s/cc) | Filter Loading (s/mm <sup>2</sup> ) |
|------------------|---------------|----------------------------------|------------------------|--|-------------------------------|-------------------------------|-------------------------------------|
| 3W-031512 W      | EM 872918     | 0.1000                           | 828                    | 1                                      | 0.0046                        | 0.0046                        | 10.0                                |
| 3W-031512 N      | EM 872919     | 0.1000                           | 826                    | ND                                     | 0.0047                        | BAS                           | BAS                                 |
| 3W-031512 E      | EM 872920     | 0.1000                           | 828                    | 1                                      | 0.0046                        | 0.0046                        | 10.0                                |
| 3W-031512 S      | EM 872921     | 0.1000                           | 828                    | ND                                     | 0.0046                        | BAS                           | BAS                                 |

NA = Not Analyzed  
 ND = None Detected  
 BAS = Below Analytical Sensitivity  
 Average Grid Opening in mm<sup>2</sup> = 0.010

Filter Material = Mixed Cellulose Ester  
 Filter Diameter = 25 mm  
 Effective Filter Area = 385 sq mm

*EE*  
 Digitally signed by  
 Elaine Eberman  
 DN: cn = Elaine  
 Eberman, c = US,  
 o = Reservoirs  
 Environmental,  
 Inc.,  
 Date: 2012.03.19  
 10:30:18 -0500

DATA QA

# RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

TABLE II. SUMMARY OF ANALYTICAL DATA

RES Job Number: RES 231818-1  
 Client: R & R Environmental  
 Client Project Number / P.O.: None Given  
 Client Project Description: 3rd West Sub - RMP  
 Date Samples Received: March 16, 2012  
 Analysis Type: TEM, AHERA  
 Turnaround: 6 Hour  
 Date Samples Analyzed: March 17, 2012

| Client<br>ID Number | Lab<br>ID Number | Asbestos<br>Mineral | Asbestos Structure Types* |         |          |          | Structures<br>>5 Microns<br>in Length | **Excluded<br>Structures | Asbestos<br>Structures<br>for<br>Concentration |
|---------------------|------------------|---------------------|---------------------------|---------|----------|----------|---------------------------------------|--------------------------|--|
|                     |                  |                     | Fibers                    | Bundles | Clusters | Matrices |                                       |                          |  |
| 3W-031512 W         | EM 872918        | Chrysotile          | 1                         | 0       | 0        | 0        | 0                                     | 0                        | 1  |
| 3W-031512 N         | EM 872919        | ND                  | 0                         | 0       | 0        | 0        | 0                                     | 0                        | 0  |
| 3W-031512 E         | EM 872920        | Chrysotile          | 0                         | 0       | 0        | 1        | 0                                     | 0                        | 1  |
| 3W-031512 S         | EM 872921        | ND                  | 0                         | 0       | 0        | 0        | 0                                     | 0                        | 0  |

\*See Analytical Procedure for definitions

\*\*C = Excluded from total due to lack of confirmation

\*\*L = Excluded from total for length less than 0.5 micron (AHERA only)

\*\*A = Excluded from total due to incorrect aspect ratio

ND = None Detected

Due Date: 3-17-12  
Due Time: 8:40

**RES-LAB** **Reservoirs Environmental, Inc.**  
5801 Logan St. Denver, CO 80216 • Ph: 303 964-1986 • Fax: 303-477-4276 • Toll Free: 866-RES-ENV  
Pager: 303-509-2098

Job # \_\_\_\_\_  
Page 1 of 1

## INVOICE TO: (IF DIFFERENT)

## CONTACT INFORMATION:

|  |                                       |                                |             |
|--|---------------------------------------|--------------------------------|-------------|
| Company: <u>REP Environmental</u>                                  | Company:                              | Contact: <u>Dave Roskelley</u> | Contact:    |
| Address: <u>47 W 900S #2</u>                                       | Address:                              | Phone:                         | Phone:      |
| <u>Sandy W. 84070</u>  |                                       | Fax:                           | Fax:        |
|  |                                       | Cell/pager:                    | Cell/pager: |
| Project Number and/or P.O. #:                                      | Final Date Deliverable Email Address: |                                |             |
| Project Description/Location: <u>3<sup>rd</sup> West Sub - RMP</u> | <u>dave@renviro.com</u>               |                                |             |

| ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm  |  | REQUESTED ANALYSIS                           |   |                          |                          |                     |   |                 |                 |                     |               | VALID MATRIX CODES                         |                               | LAB NOTES:                       |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
|---|--|--|---|--------------------------|--------------------------|---------------------|---|-----------------|-----------------|---------------------|---------------|--|-------------------------------|----------------------------------|---------------------------------|------------------------------|---|----------------------------------|--------------------------|-------------|--------------|-------------------------|--------------------------|---------------------------------|
| PLM / PCM / TEM   | RUSH (Same Day) / PRIORITY (Next Day) / STANDARD | PLM - Short report, Long report, Point Count | TEM - AHERA, Level II, 7402, ISO, +/-, Quant, Semi-quant, Micro-vac, ISO-indirect Preps | PCM - 7400A, 7400B, OSHA | DUST - Total, Respirable | METALS - Analyte(s) | RCRA 8, TCLP, Welding Fume, Metals Scan | ORGANICS - METH | Salmonella: +/- | E.coli O157:H7: +/- | Listeria: +/- | Aerobic Plate Count: +/- or Quantification | E.coli: +/- or Quantification | Califorms: +/- or Quantification | S.aureus: +/- or Quantification | Y & M: +/- or Quantification | Mold: +/-, Identification, Quantification | SAMPLERS INITIALS OR OTHER NOTES | Sample Volume (L) / Area | Matrix Code | # Containers | Date Collected mm/dd/yy | Time Collected hh:mm a/p | EM Number (Laboratory Use Only) |
| CHEMISTRY LABORATORY HOURS: Weekdays: 8am - 5pm   |  |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| Metal(s) / Dust   | RUSH 24 hr. 3-5 Day                              |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| RCRA 8 / Metals & Welding   | RUSH 5 day 10 day                                |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| Fume Scan / TCLP  |  |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| Organics  | 24 hr. 3 day 5 Day                               |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| MICROBIOLOGY LABORATORY HOURS: Weekdays: 8am - 6pm  |  |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| E.coli O157:H7, Coliforms, S.aureus   | 24 hr. 2 Day 3-5 Day                             |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| Salmonella, Listeria, E.coli, APC, Y & M  | 48 Hr. 3-5 Day                                   |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| Mold  | RUSH 24 Hr 48 Hr 3 Day 5 Day                     |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| **Turnaround times establish a laboratory priority, subject to laboratory volume and are not guaranteed. Additional fees apply for afterhours, weekends and holidays.** |  |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| Special Instructions:   |  |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| Client sample ID number (Sample ID's must be unique)  |  |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| 1   | 3W-031512W                                       |  | X   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  | 828                      | A           |              | 3/15/12                 |                          | 872918                          |
| 2   | <del>3W-031512W</del> 3W-031512N                 |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  | 826                      |             |              |                         |                          | 19                              |
| 3   | 3W-031512E                                       |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  | 828                      |             |              |                         |                          | 20                              |
| 4   | 3W-031512S                                       |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  | 828                      |             |              |                         |                          | 21                              |
| 5   |  |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| 6   |  |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| 7   |  |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| 8   |  |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| 9   |  |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |
| 10  |  |  |   |                          |                          |                     |   |                 |                 |                     |               |  |                               |                                  |                                 |                              |   |                                  |                          |             |              |                         |                          |                                 |

Number of samples received: 4 (Additional samples shall be listed on attached long form.)

NOTE: REI will analyze incoming samples based on information received and will not be responsible for errors or omissions in calculations resulting from the inaccuracy of original data. By signing client/company representative agrees that submission of the following samples for requested analysis as indicated on this Chain of Custody shall constitute an analytical services agreement with payment terms of NET 30 days, failure to comply with payment terms may result in a 1.5% monthly interest surcharge.

|                                     |                                |                           |                         |                 |                 |                 |                 |
|-------------------------------------|--------------------------------|---------------------------|-------------------------|-----------------|-----------------|-----------------|-----------------|
| Relinquished By: <u>[Signature]</u> | Fed Ex                         | Date/Time: <u>3/15/12</u> | Sample Condition: _____ | On Ice: _____   | Sealed: _____   | Intact: _____   |                 |
| Laboratory Use Only                 |                                |                           | Temp. (F°) _____        | Yes / No: _____ | Yes / No: _____ | Yes / No: _____ |                 |
| Received By: <u>[Signature]</u>     | Date/Time: <u>3-16-12 8:40</u> | Carrier: <u>FedEx</u>     |                         |                 |                 |                 |                 |
| Results:                            | Contact: <u>Dave</u>           | Phone: _____              | Email: _____            | Fax: _____      | Date: _____     | Time: _____     | Initials: _____ |
|                                     | Contact: _____                 | Phone: _____              | Email: _____            | Fax: _____      | Date: _____     | Time: _____     | Initials: _____ |

## Attachment I

### Key to Count Sheets Count Sheets Analytical Procedures

Structures identifications consist of an Asbestos Type followed by a Structure Type

#### Asbestos Type

A = Amosite  
An = Anthophyllite  
C = Chrysotile  
Cr = Crocidolite  
T = Tremolite

#### Structure Types

F = Fiber  
B = Bundle  
C = Cluster  
M = Matrix

ND = no structures detected  
M = other structure associated with a matrix  
NAM = Non Asbestos Mineral  
XGB = partly obscured by a grid bar

#### Sizing Conversion

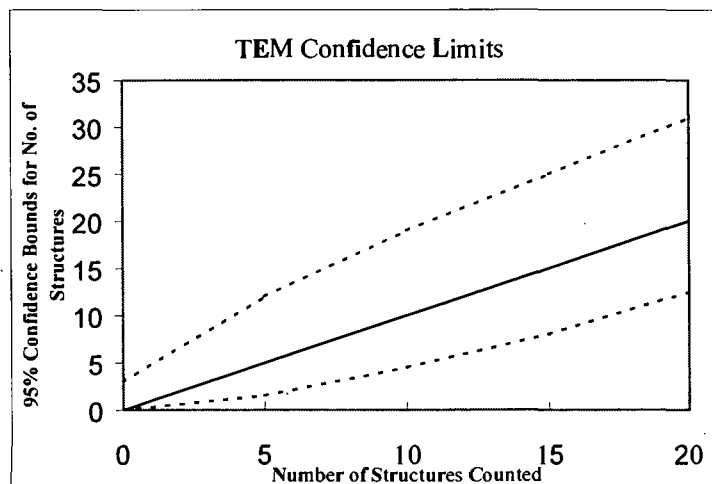
1 length unit = 5 mm on screen = 0.278 micron  
1.80 length units = 0.5 micron  
18.0 length units = 5 microns

1 width unit = 1 mm on screen = 0.0556 micron

#### TEM Analysts

Jeanne S. Orr  
Nathan DelHierro  
Angela Heitger  
Jonathan Bernard

Paul D. LoScalzo  
Mark Steiner  
Norberto Zimbleman  
Robert Workman



Upper and lower 95% confidence bounds for the number of structures counted assuming a Poisson distribution.

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

|  |                 |
|--|-----------------|
| Laboratory name:                         | REI             |
| Instrument                               | JEOL 100 CX N S |
| Voltage (KV)                             | 100 KV          |
| Magnification                            | 20KX 10KX       |
| Grid opening area (mm <sup>2</sup> )     | 0.01            |
| Scale: 1L =                              | 0.28 um         |
| Scale: 1D =                              | 0.056 um        |
| Primary filter area (mm <sup>2</sup> )   | 385             |
| Secondary Filter Area (mm <sup>2</sup> ) |                 |
| QA Type                                  |                 |

|  |         |
|--|---------|
| Client :                                       | R+R     |
| Sample Type (A=Air, D=Dust):                   | A       |
| Air volume (L) or dust area (cm <sup>2</sup> ) | 828     |
| Date received by lab                           | 3/16/12 |
| Lab Job Number:                                | 231818  |
| Lab Sample Number                              | 872918  |

## F-Factor Calculation (Indirect Preps Only):

|   |  |
|---|--|
| Fraction of primary filter used         |  |
| Total Resuspension Volume (ml)          |  |
| Volume Applied to secondary filter (ml) |  |

|   |                |
|---|----------------|
| Analyzed by                                       | AK             |
| Analysis date:                                    | 3/16/12        |
| Method (D=Direct, I=Indirect, IA=Indirect, ashed) | D              |
| Counting rules (ISO, AHERA, ASTM)                 | AA             |
| Grid storage location                             | Month Analyzed |
| Scope Alignment                                   | Date Analyzed  |

| Grid | Grid Opening | Structure Type | No. of Structures |       | Dimensions |       | Identification               | Mineral Class |   |     | Sketch/Comments | 1 = yes, blank = no |       |     |
|------|--------------|----------------|-------------------|-------|------------|-------|------------------------------|---------------|---|-----|-----------------|---------------------|-------|-----|
|      |              |                | Primary           | Total | Length     | Width |                              | Amphibole     | C | NAM |                 | Sketch              | Photo | EDS |
| A    | H4-3         | ND             |                   |       |            |       |                              |               |   |     |                 |                     |       |     |
|      | G4-3         | ND             |                   |       |            |       | Prer A JxL intact 57. debris |               |   |     |                 |                     |       |     |
|      | F4-3         | ND             |                   |       |            |       | Prer B nt                    |               |   |     | 3/16/12         |                     |       |     |
|      | C4-3         | ND             |                   |       |            |       |                              |               |   |     |                 |                     |       |     |
|      | E4-3         | ND             |                   |       |            |       |                              |               |   |     |                 |                     |       |     |
| B    | L4-3         | F              |                   | 1     | 7          | 1     | cd                           |               | / |     |                 |                     |       |     |
|      | K4-3         | ND             |                   |       |            |       |                              |               |   |     |                 |                     |       |     |
|      | H4-3         | ND             |                   |       |            |       |                              |               |   |     |                 |                     |       |     |
|      | G4-3         | ND             |                   |       |            |       |                              |               |   |     |                 |                     |       |     |
|      | F4-3         | ND             |                   |       |            |       |                              |               |   |     |                 |                     |       |     |

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

|  |                  |
|--|------------------|
| Laboratory name:                         | REI              |
| Instrument                               | JEOL 100 CX N 50 |
| Voltage (KV)                             | 100 KV           |
| Magnification                            | 20KX 10KX        |
| Grid opening area (mm <sup>2</sup> )     | 0.01             |
| Scale: 1L =                              | 0.28 um          |
| Scale: 1D =                              | 0.056 um         |
| Primary filter area (mm <sup>2</sup> )   | 385              |
| Secondary Filter Area (mm <sup>2</sup> ) |                  |
| QA Type                                  |                  |

|  |         |
|--|---------|
| Client :                                       | R+R     |
| Sample Type (A=Air, D=Dust):                   | A       |
| Air volume (L) or dust area (cm <sup>2</sup> ) | 826     |
| Date received by lab                           | 3/16/12 |
| Lab Job Number:                                | 231828  |
| Lab Sample Number                              | 872919  |

|   |                |
|---|----------------|
| Analyzed by                                       | CM             |
| Analysis date                                     | 3/16/12        |
| Method (D=Direct, I=Indirect, IA=Indirect, ashed) | D              |
| Counting rules (ISO, AHERA, ASTM)                 | AA             |
| Grid storage location                             | Month Analyzed |
| Scope Alignment                                   | Date Analyzed  |

## F-Factor Calculation (Indirect Preps Only):

|   |  |
|---|--|
| Fraction of primary filter used         |  |
| Total Resuspension Volume (ml)          |  |
| Volume Applied to secondary filter (ml) |  |

| Grid | Grid Opening | Structure Type | No. of Structures |       | Dimensions |       | Identification            | Mineral Class |   |     | Sketch/Comments | 1 = yes, blank = no |       |     |
|------|--------------|----------------|-------------------|-------|------------|-------|---------------------------|---------------|---|-----|-----------------|---------------------|-------|-----|
|      |              |                | Primary           | Total | Length     | Width |                           | Amphibole     | C | NAM |                 | Sketch              | Photo | EDS |
| A    | G5-1         | ND             |                   |       |            |       |                           |               |   |     |                 |                     |       |     |
|      | F5-1         | ND             |                   |       |            |       | Prep A 85% mass 5% debris |               |   |     |                 |                     |       |     |
|      | G5-1         | ND             |                   |       |            |       | Prep B-A                  |               |   |     | 3/16/12         |                     |       |     |
|      | C5-1         | ND             |                   |       |            |       |                           |               |   |     |                 |                     |       |     |
|      | C5-3         | ND             |                   |       |            |       |                           |               |   |     |                 |                     |       |     |
| B    | F3-6         | ND             |                   |       |            |       |                           |               |   |     |                 |                     |       |     |
|      | E3-6         | ND             |                   |       |            |       |                           |               |   |     |                 |                     |       |     |
|      | C3-6         | ND             |                   |       |            |       |                           |               |   |     |                 |                     |       |     |
|      | B3-6         | ND             |                   |       |            |       |                           |               |   |     |                 |                     |       |     |
|      | A3-6         | ND             |                   |       |            |       |                           |               |   |     |                 |                     |       |     |

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material



Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

|  |                  |
|--|------------------|
| Laboratory name:                         | REI              |
| Instrument                               | JEOL 100 CX N 52 |
| Voltage (KV)                             | 100 KV           |
| Magnification                            | 20KX 10KX        |
| Grid opening area (mm <sup>2</sup> )     | 0.01             |
| Scale: 1L =                              | 0.28 $\mu$ m     |
| Scale: 1D =                              | 0.056 $\mu$ m    |
| Primary filter area (mm <sup>2</sup> )   | 385              |
| Secondary Filter Area (mm <sup>2</sup> ) |                  |
| QA Type                                  |                  |

|  |         |
|--|---------|
| Client:  | R+R     |
| Sample Type (A=Air, D=Dust):                   | A       |
| Air volume (L) or dust area (cm <sup>2</sup> ) | 828     |
| Date received by lab                           | 3/16/12 |
| Lab Job Number:                                | 231818  |
| Lab Sample Number:                             | 872920  |

## F-Factor Calculation (Indirect Preps Only):

|   |  |
|---|--|
| Fraction of primary filter used         |  |
| Total Resuspension Volume (ml)          |  |
| Volume Applied to secondary filter (ml) |  |

|   |                |
|---|----------------|
| Analyzed by                                       | CK             |
| Analysis date                                     | 3/16/12        |
| Method (D=Direct, I=Indirect, IA=Indirect, ashed) | D              |
| Counting rules (ISO, AHERA, ASTM)                 | AA             |
| Grid storage location                             | Month Analyzed |
| Scope Alignment                                   | Date Analyzed  |

| Grid | Grid Opening | Structure Type | No. of Structures |       | Dimensions |       | Identification               | Mineral Class |   |     | Sketch/Comments | 1 = yes, blank = no |       |     |
|------|--------------|----------------|-------------------|-------|------------|-------|------------------------------|---------------|---|-----|-----------------|---------------------|-------|-----|
|      |              |                | Primary           | Total | Length     | Width |                              | Amphibole     | C | NAM |                 | Sketch              | Photo | EDS |
| A    | K4-4         | ND             |                   |       |            |       |                              |               |   |     |                 |                     |       |     |
|      | H4-4         | ND             |                   |       |            |       | Prep A 90% intact SF, debris |               |   |     |                 |                     |       |     |
|      | G4-4         | ND             |                   |       |            |       | Prep B 80% intact SF, debris |               |   |     | 3/16/12         |                     |       |     |
|      | F4-4         | ND             |                   |       |            |       |                              |               |   |     |                 |                     |       |     |
|      | E4-4         | ND             |                   |       |            |       |                              |               |   |     |                 |                     |       |     |
| B    | F4-1         | ND             |                   |       |            |       |                              |               |   |     |                 |                     |       |     |
|      | E4-1         | ND             |                   |       |            |       |                              |               |   |     |                 |                     |       |     |
|      | C4-1         | ND             |                   |       |            |       |                              |               |   |     |                 |                     |       |     |
|      | C3-4         | M              |                   | 1     | 2          | 1     | CP                           |               | - |     |                 |                     |       |     |
|      | B3-4         | ND             |                   |       |            |       |                              |               |   |     |                 |                     |       |     |

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.  
TEM Asbestos Structure Count

|  |                  |
|--|------------------|
| Laboratory name:                         | REI              |
| Instrument                               | JEOL 100 CX N S2 |
| Voltage (KV)                             | 100 KV           |
| Magnification                            | 20KX 10KX        |
| Grid opening area (mm <sup>2</sup> )     | 0.01             |
| Scale: 1L =                              | 0.28 um          |
| Scale: 1D =                              | 0.056 um         |
| Primary filter area (mm <sup>2</sup> )   | 385              |
| Secondary Filter Area (mm <sup>2</sup> ) |                  |
| QA Type                                  |                  |

|  |         |
|--|---------|
| Client:  | R+R     |
| Sample Type (A=Air, D=Dust):                   | A       |
| Air volume (L) or dust area (cm <sup>2</sup> ) | 829     |
| Date received by lab                           | 3/16/12 |
| Lab Job Number:                                | 231818  |
| Lab Sample Number:                             | 972921  |

|   |                |
|---|----------------|
| Analyzed by                                       | CH             |
| Analysis date                                     | 3/16/12        |
| Method (D=Direct, I=Indirect, IA=Indirect, ashed) | D              |
| Counting miles (ISO, AHERA, ASTM)                 | AA             |
| Grid storage location                             | Month Analyzed |
| Scope Alignment                                   | Data Analyzed  |

## F-Factor Calculation (Indirect Preps Only):

|   |  |
|---|--|
| Fraction of primary filter used         |  |
| Total Resuspension Volume (ml)          |  |
| Volume Applied to secondary filter (ml) |  |

| Grid | Grid Opening | Structure Type | No. of Structures |       | Dimensions |       | Identification | Mineral Class |   |     | Sketch/Comments | 1 = yes, blank = no |       |     |
|------|--------------|----------------|-------------------|-------|------------|-------|----------------|---------------|---|-----|-----------------|---------------------|-------|-----|
|      |              |                | Primary           | Total | Length     | Width |                | Amphibole     | C | NAM |                 | Sketch              | Photo | EDS |
| A    | H3-6         | ND             |                   |       |            |       |                |               |   |     |                 |                     |       |     |
|      | G3-6         | ND             |                   |       |            |       |                |               |   |     |                 |                     |       |     |
|      | F3-6         | ND             |                   |       |            |       |                |               |   |     |                 |                     |       |     |
|      | E3-6         | ND             |                   |       |            |       |                |               |   |     |                 |                     |       |     |
|      | C3-6         | ND             |                   |       |            |       |                |               |   |     |                 |                     |       |     |
| B    | G4-1         | ND             |                   |       |            |       |                |               |   |     |                 |                     |       |     |
|      | F4-1         | ND             |                   |       |            |       |                |               |   |     |                 |                     |       |     |
|      | E4-1         | ND             |                   |       |            |       |                |               |   |     |                 |                     |       |     |
|      | F4-3         | ND             |                   |       |            |       |                |               |   |     |                 |                     |       |     |
|      | E4-3         | ND             |                   |       |            |       |                |               |   |     |                 |                     |       |     |

LA = Libby-type amphibole

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T:\QAQC\Lab\TEM\Lab Docs\Arch\ve\TEM Count Sheet rev.1-11.xls

## Analytical Procedures – AHERA

Transmission electron microscopy/energy dispersive X-ray spectrometry/selected area electron diffraction (TEM/EDX/SAED) was employed in the analysis of the samples, which were collected on 25 mm mixed cellulose ester air filters. A portion of each filter was collapsed with acetone and etched in a plasma asher. The etched filter was then coated with a thin layer of carbon in a carbon side down. The sample was then placed inside a condensation washer and treated with acetone to remove the filter matrix and expose any inert material.

For each sample, enough grid openings on a 200 mesh TEM grid are analyzed to ensure an analytical sensitivity of at least 0.005 structures/cc. A minimum of four grid openings from two preparations are analyzed for each sample. The grid openings are searched for fibrous structures which, if present are analyzed by SAED and/or EDX (elemental analysis). The AHERA protocol requires SAED confirmation of enough chrysotile asbestos structures on each sample to cause the sample to exceed 70 structures/mm<sup>2</sup> (usually 4 or 5 structures). Both SAED and EDX confirmation are required of enough amphibole structures on each sample to cause the sample to exceed 70 structures/mm<sup>2</sup> (usually 4 or 5 structures) per sample. Either SAED or EDX is required for the remaining asbestos structures of either type. The morphology of each structure is determined and the length and the diameter of any asbestos structures are recorded. Asbestos fibers, bundles, cluster and matrices were identified and recorded. The asbestos structures have been defined in AHERA as follows:

|                 |   |
|-----------------|---|
| <b>Fiber:</b>   | is a structure having a minimum length greater than or equal to 0.5 micron with an aspect ratio of 5:1 or greater with substantially parallel sides.            |
| <b>Bundle:</b>  | is a structure composed of three or more fibers in parallel arrangement, with each fiber closer than the diameter of one fiber.                                 |
| <b>Cluster:</b> | is a structure with fibers in random arrangements such that all fibers are intermixed and no single fiber is isolated from the group.                           |
| <b>Matrix:</b>  | is a fiber or fibers with one end free and the other end embedded or hidden by a particulate. The exposed fiber end must meet the fiber definition given above. |

If more than 50 asbestos structures are identified and confirmed on a sample, AHERA analysis may be terminated after completion of the grid opening, which contains the 50<sup>th</sup> structure. AHERA protocol requires the laboratory to reject any clearance sample which contains in excess of 25% total particulate loading or which appears to be unevenly loaded.

The AHERA protocol includes specific sampling requirements, including minimum numbers of samples and minimum air volumes. Specifically, the 70 structures/mm<sup>2</sup> clearance criteria is only allowed for sets five inside samples (collected in a group of 13 samples including: five outsides and three blanks) with volumes greater than 1200 liters (40 CFR Part 763, page 41894). Deviation from the AHERA sampling protocol may affect the validity of the analytical results. Analysis of samples collected by non-protocol methods are not accredited by NVLAP

### Equations Used for Calculations

$$\text{Area Analyzed, mm}^2 = \# \text{ GO counted} \times \text{Average GO Area (mm)}$$

$$\text{Concentration, s/cc} = \frac{\# \text{ Asbestos Structures}}{\# \text{ GO Counted}} \times \frac{1}{\text{Volume (L)}} \times \frac{\text{Eff Filter Area (mm}^2\text{)}}{\text{Average GO area (mm}^2\text{)}} \times \frac{\text{IL}}{1000\text{cc}}$$

$$\text{Filter loading, s/mm}^2 = \frac{\# \text{ Asbestos structures}}{\text{Area Analyzed (mm}^2\text{)}}$$

GO = TEM grid opening